ASOS MODIFICATION NOTE 21 (for Electronics Technicians)
Engineering Division
W/OSO321:BGM

SUBJECT : Firmware Upgrade for ASOS Light Emitting Diode Weather Indicator (LEDWI)

PURPOSE : Removal and replacement of U11 EPROM located on the Present Weather Sensor, Microprocessor Board S100-2MT2A1A1A3.

EQUIPMENT AFFECTED : ASOS Present Weather Sensor Microprocessor Board

PARTS REQUIRED : EPROM Version 3.64

MODIFICATION PROCUREMENT : The above parts are available through NLSC. Technicians should order S100-2MT2A1A1A3-U11, firmware, Rev. 3.64 LEDWI system. Review Appendix A for specific sites requiring the upgrade. ECP: E93SM05F090D

SPECIAL TOOLS REQUIRED : None

TIME REQUIRED : 1 hour

EFFECT ON OTHER INSTRUCTIONS: Supersedes Engineering Handbook 11, Volume 2, ASOS Modification Note 5

VERIFICATION STATEMENT : This modification was successfully tested for operational integrity at Sterling, VA, Johnstown, PA, and Silver Spring, MD. Operational field testing has been conducted at sites listed in Appendix B.

General:

Present weather sensors contain firmware versions 3.49 or 3.61. LEDWI firmware version 3.64 turns the hood heaters "ON" when the LEDWI detects "S+". The LEDWI heater voltage is increased from 24 VDC to 28 VDC. The resulting increased heater power will reduce the build up of ice under the top of the hoods and reduce ice build-up at the base of the transmitter and receiver windows.

BEFORE BEGINNING PROCEDURE

1. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone that you will be completing modification note 21. Confirm that AOMC will provide access to the site-specific data base.

2. Get approval of the responsible MIC/OIC before starting deactivation. You may deactivate on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.

3. **Commissioned Sites Only**: Do **not** start deactivation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions is expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.

4. Do not start deactivation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although about 45 minutes should be sufficient, allow 1 hour to complete deactivation and restart ASOS.

5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/ observer will inform the tower and any other critical users that the LEDWI will be shut off for deactivation (unstaffed sites, the el tech will inform tower). He/She will alert towers using Controller Video Displays (CVD) and Operator Interface Devices (OID) to log off and shut down display power to avoid confusion. At commissioned sites only, download the following data to your laptop using the direct command mode: 5-minute data (12 hrs.), SYSLOG information (24 hrs.), SHEF messages (24 hrs.), and any 2-hour archive files.

6. Do not begin the deactivation process, i.e., halt ASOS, until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.

7. Log on as TECH, turn off report processing for the LEDWI, stop here and perform the modification MOD 21.

Procedure:
Instructions for installing LEDWI Firmware 3.64

I Replace the LEDWI Firmware

1. At the DCP, turn the LEDWI circuit breakers to "OFF".
2. At the LEDWI, open the electronics enclosure door.
3. Remove the MPU card located in the card cage, 3rd slot from the top. Refer to Figure 1.

CAUTION SHOULD BE EXERCISED WHEN REMOVING AND REPLACING THE FIRMWARE!

4. Referring to the attached drawing LEDWI MPU card, carefully remove the EPROM located in the U11 position. Refer to Figure 3.
5. Install the 3.64 revision EPROM in the U11 position of the MPU card.
6. Reinstall the MPU card in 3rd slot of the card cage.

II Adjust the power supply

1. Locate FRU9 using Figure 1.
2. Connect a DVM to FRU9 using Figure 2 as a guide. The (+) lead of the DVM connects to the (+ OUT) bifurcated terminal and the (-) lead of the DVM connects to the (-OUT) bifurcated terminal.
3. At the DCP, turn the LEDWI circuit breakers to "ON."
4. Adjust heater power supply voltage. Using Figure 2, locate R11(V. **Adj**) on FRU9. Adjust R11 clockwise until the DVM reads 28± 0.02 VDC. Read the DVM and record the voltage here:_____VDC.
5. Heater power full load check and adjustment. Block the transmit beam for several minutes to turn on the hood heaters. After 2-3 minutes, determine if heaters are ON by feeling for heat.

CAUTION: USE EXTREME CARE AS THE HEATERS MAY BECOME HOT ENOUGH TO BURN SKIN. DO NOT TOUCH THE HOOD HEATERS DIRECTLY.

6. Read the DVM and record the full load voltage here:_____ VDC.
7. Verify that the full load voltage is within ± 0.5V of the nominal voltage set in step above.
8. Remove the block from the transmit beam.
9. Disconnect the DVM from FRU9.
10. Press RESET button on the MPU card.
11. Close and secure the door of the electronics enclosure.

III. Validate the change

1. At the OID, verify that present weather data is being received on the 12-hour screen. The data will display 'M' for missing while the sensor was turned off.
2. Key the LEDWI maintenance screen and verify that the sensor is passing all self-tests. If 10 minutes has passed since the sensor was turned "ON," the data quality should be "P" for pass also.
3. Clear all errors after the sensor self-test and data quality report pass.
4. Enter (MAINT, ACTION, FMK) keys and the field mod kit number as MOD 21.
5. Check the SYSLOG/WRITE and verify the FMK message.
6. Exit the maintenance screen and bring up the SYSLOG/WRITE screen. Annotate the changes made to the LEDWI.
7. Turn on report processing for the LEDWI. Notify the AOMC via telephone that Mod 21 has been completed.

Reporting Modification

Target date for completion of this modification is 30 days after receipt of parts. Report completed modification on WS Form A-26 maintenance record, per instructions in EHB-4, Part 2, Appendix F, using reporting code APWX. An example of a completed Form A-26 is provided.

Acting Chief, Engineering Division

W/OSO321:AJWissman:rz:6/19/95:corrected 6/28/95:"asomod21.h11", on disk hb11-f
redone again on 7/3/94:rz:redone again on 7/7/95:redone 7/14/95

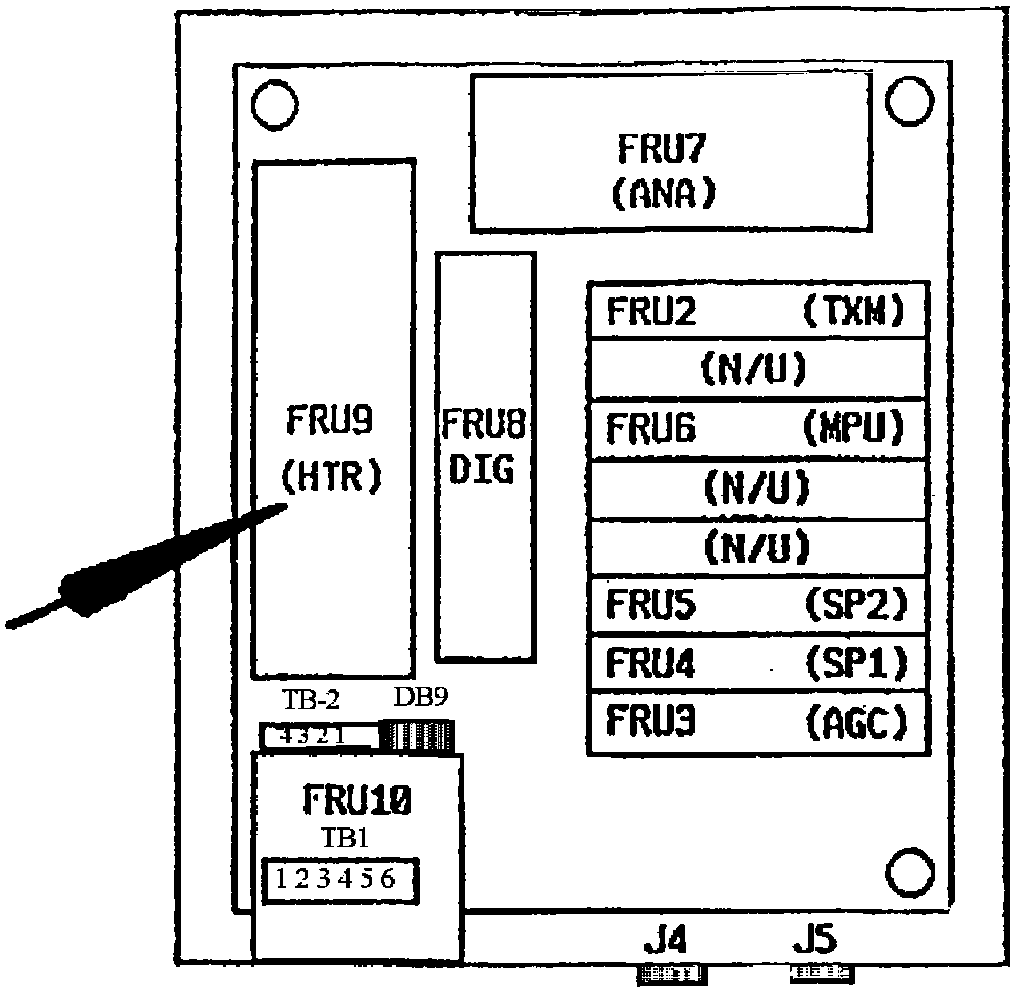

FIGURE -1 LOCATION OF FRU's IN LEDWI ELECTRONICS BOX

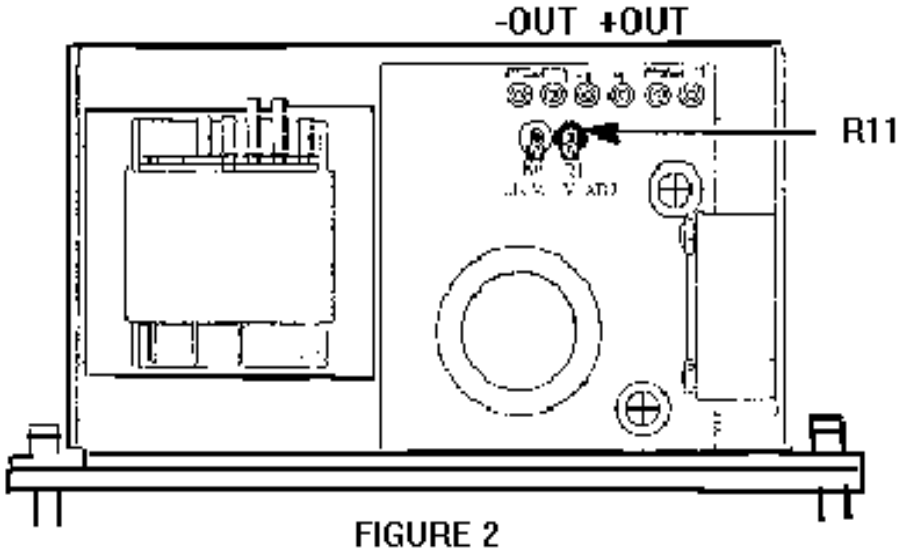

FIGURE 2

LOCATION OF ADJUSTMENT POT's ON HEATER POWER SUPPLY FRU9

Appendix A

The following list shows the SID's that require LEDWI firmware version 3.64:

07S	0A6	1S4	21A	22G
2B6	2V3	39J	3KM	3R5
3S2	3SM	3U6	47C	5B5
5C0	6R0	6V2	7G2	7MY
81J	9B9	A21	ABR	ACT
ACY	ADG	ADQ	AFN	AGS
AIA	AKN	AKO	ALB	ALW
AMW	ANC	AOH	APN	ARA
ARB	ARR	AST	ATL	ATY
AVX	AXN	AZO	B20	BDE
BEH	BFD	BFF	BFM	BGD
BGM	BHM	BIH	BIL	BIS
BIX1	BIX2	BIX3	BJJ	BKV
BLF	BLU	BMG	BML	BPI
BPK	BRD	BRO	BTL	BTM
BTR	BTT	BUY	BVO	BWG
BYG	BZN	C19	CAE	CAG
CDB	CDS	CEU	CFV	CGI
CKB	CKV	CLE	CLM	CNK
CNU	COU	CPS	CQX	CRS
CRW	CSG	CSM	CXO	CYS
DAB	DCU	DEC	DET	DFI
DGW	DHN	DHT	DKK	DLN
DMO	DNL	DRO	DSM	DSV
DTN	DTO	DTW	DVN	E02
ELM	ELN	ELY	EMP	ENA
ENW	EPH	ERI	ESF	EST
EVV	EVW	EWB	EWN	F54
F90	FAI	FCA	FDR	FFC
FFT	FHR	FIT	FLD	FLG
FNT	FOE	FOK	FSD	FSM
FST	FVE	FWA	GAG	GCK
GCN	GED	GEG	GEY	GGW
GIF	GJT	GKN	GLR	GOK
GRB	GRI	GRR	GSH	GTF
GVL	GVW	GWO	HAO	HBG
HBR	HDO	HEI	HFD	HIE
HKA	HKS	HLG	HLN	HOM
HON	HOT	HRO	HSI	HSV
HTL	HUF	HUT	HVN	HVR
HWV	HYR	I14	I15	IJD
IMT	INW	IOW	ISW	ITO
IXD	JAN	JAX	JBR	JEF
JKL	JNU	JST	KNFJ	KNJW
KNLT	KNMM	KNVT	KOA	KTN
LAA	LAN	LAW	LBT	LEE

LEX	LFT	LGU	LHX	LIH
LIT	LNK	LOU	LOZ	LVM
LWC	LWS	LWV	M06	M50
M76	MAE	MAI	MBS	MCB
MCG	MCI	MCK	MCN	MCO
MEB	MEM	MFD	MFI	MGJ
MGM	MGW	MGY	MHK	MIC
MIW	MKE	MKG	MKL	MKO
MLC	MLI	MLS	MLT	MLU
MMV	MNN	MOB	MPV	MRH
MSL	MSN	MSO	MTH	MTJ
MTO	MVL	MWH	N00	N22
N63	N80	N97	NED	NEXC
O18	O45	OFP	OGB	OGG
OJC	OLF	OLM	OMK	ONO
ORE	ORH	ORT	OSU	OVE
PADK	PAH	PAQ	PBF	PBI
PGD	PHBK	PHD	PHNA	PHNG
PHX	PIA	PIR	PKD	PLB
PLN	PNC	PPF	PSC	PTK
PTW	PUW	PWA	PWM	PYM
RAC	RBG	RFD	RHI	RIL
RKP	RSL	RVS	RZZ	S22
SAT	SAV	SBM	SBN	SCC
SCK	SEG	SFF	SGF	SIT
SLK	SLN	SMF	SMP	SMX
SNY	SOV	SPI	SPS	SPW
STC	STJ	STP	SUX	SWD
SWO	SXT	SYR	T02	T27
T31	TAL	TAN	TCL	TDZ
THV	TLH	TMB	TOI	TOR
TQE	TRL	TUP	TUS	U11
U73	UCA	UNO	VEL	VPZ
VSF	W52	WLD	WVI	X41
YKM	YNG			

Appendix B

The following list shows the SID's that operationally tested LEDWI firmware version 3.64:

Eastern Region

BML, BGM, CRW, AFN, 2B6, ORE, PWM, SYR, HIE, IPT, ILG

Southern Region

AMA, FSM, OKC, ACT, SPS

Central Region

AKO, ALS, COS, CNK, DVX, DDC, DBQ, GLD, GRI, LNK, SDF, MCW, MTJ, PUB, RST, SNY, SUX, TOP, ICT

Western Region

AST, ELY, BLU, FLG, GGW, GCN, GTF, HVR, FCA, MSO, SEA, SXT, SMP, WMC

Alaska Region

CDB, OTZ, OME